

JSC Hosts Three-Day Black History Program

Not many Americans know that the first clock built completely in America was built by scientist-mathematician-astronomer-surveyor-clockmaker Benjamin Banneker (1731-1806). Even fewer know that Banneker was black.

Banneker's contributions to America's culture and history as well as those of other black Americans will be featured February 9-13 at JSC as the Center's participation in National Black History Month. A three-day program of entertainment groups, guest speakers and an exhibit, *Traditions of our Peoples*, will be held in the JSC Auditorium.

Following the theme *American for All Americans Festival USA: Let Us Celebrate*, the JSC program will begin at 11:30 am with "Soul-Searching Music of the Black Man" — black cultural expressions interpreted by soloists and bands from the Houston-Galveston area.

The award-winning film *Legacy of a Dream* will be shown in the Auditorium February 12 at 11:30 am and again at 12:30 pm.

Among guest speakers on the February 13 program starting at 1 pm in the Auditorium will be

Bioprocessing Meeting Held Here in March

More than 150 industrial and academic researchers will meet March 10-12 at JSC to examine potentials of processing biological materials in space flight.

The Colloquium on Bioprocessing in Space will be held in the JSC Gilruth Recreation Facility to acquaint researchers in the pharmaceutical, biomedical and biological fields with the opportunities to fly bioprocessing experiments aboard Spacelab in the 1980's. Spacelab is a manned space station being built by a consortium of 10 European countries which will be carried into Earth orbit in the cargo bay of the Space Shuttle Orbiter.

Space processing experiments flown in Apollo, Skylab and Apollo-Soyuz — last summer's joint manned flight with the Soviet Union — revealed that many materials exhibit unique characteristics in the weightlessness of space flight.

Electrophoresis experiments on Apollo-Soyuz have shown promise as possible means of separating human kidney cells capable of producing an enzyme, urokinase, for treating blood-clotting disorders and in isolating white blood cells needed for leukemia patient transfusions.

The JSC Colloquium will cover the technical details of biomedical material behavior in weightlessness, a description of Spacelab and Space Shuttle research facilities and flight opportunities, results of biological experiments already conducted, and a survey of potential research and industrial space applications.

The agenda for Monday, March 10, includes presentations on the

(Continued on page 4)

NASA Deputy Assistant Administrator for Community and Human Relations Ruth Bates Harris and Judge Andrew Jefferson of Houston.

The Festival is open to all JSC and contractor employees. A schedule of events is on page 2.

Viking Sails Past Midpoint In Mars Trip

Mars-bound Viking 1 last week sailed past the half-way mark in its 304-day journey to the red planet. NASA Jet Propulsion Laboratory scientists watching Viking's systems on telemetry said the spacecraft was "in excellent condition" as it passed the 152-day mark toward deboosting into martian orbit June 19.

Viking 1's Lander is given a 50-50 chance of meeting the July 4th Bicentennial date for landing on Mars to begin a search for life forms. Mechanical scoops on the Landers will gather martian soil samples and analyze them for the presence of biological organisms, then telemeter any signs of life back to Earth.

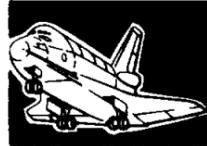
At the halfway point, Viking 1 was 52 million miles from Earth and 22 million miles from Mars, but because of the orbital motion of the two planets, Viking will have to make a 505-million mile trip through space to intercept Mars.

Viking 2 trails its sister spacecraft by 3.7 million miles, and will enter martian orbit August 2 with descent of its Lander in early September.

ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS



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Friday January 30, 1976



ALUMINUM MAIDEN — Not a torture instrument from the Inquisition but the Skeletal Muscle Stress Apparatus gives physician-astronaut Dr. Story Musgrave a rugged workout during the Life Sciences Spacelab Mission Simulation II which ends Sunday. Watching data from the experiment, designed to measure changes in crew muscle characteristics on long spaceflights, is Sim II crewman-physiologist Dr. Charles S. Sawin. Musgrave, Sawin and nuclear chemist Dr. Robert S. Clark, who worked the Spacelab night shift, will end the seven-day simulation Sunday.

JSC Spacelab 'Crew' Ends Week Of Experiment Simulation Sunday

A team of space scientists, headed by astronaut-physician Dr. Story Musgrave, Monday began a week-long, around-the-clock, test of experiments and procedures in a Space Shuttle Spacelab mockup at JSC.

The three scientists are living and working inside the Spacelab and carry out more than 20 experi-

ments in space medicine and one in space physics. When not working in the 6.8 meter (22 ft.) by 4.06 meter (13 ft.) Spacelab, the three men will eat, sleep and perform other space related duties in a mockup of the Shuttle Orbiter crew compartment. The Orbiter is the reuseable portion of the Shuttle

which is scheduled for first orbital flight in 1979.

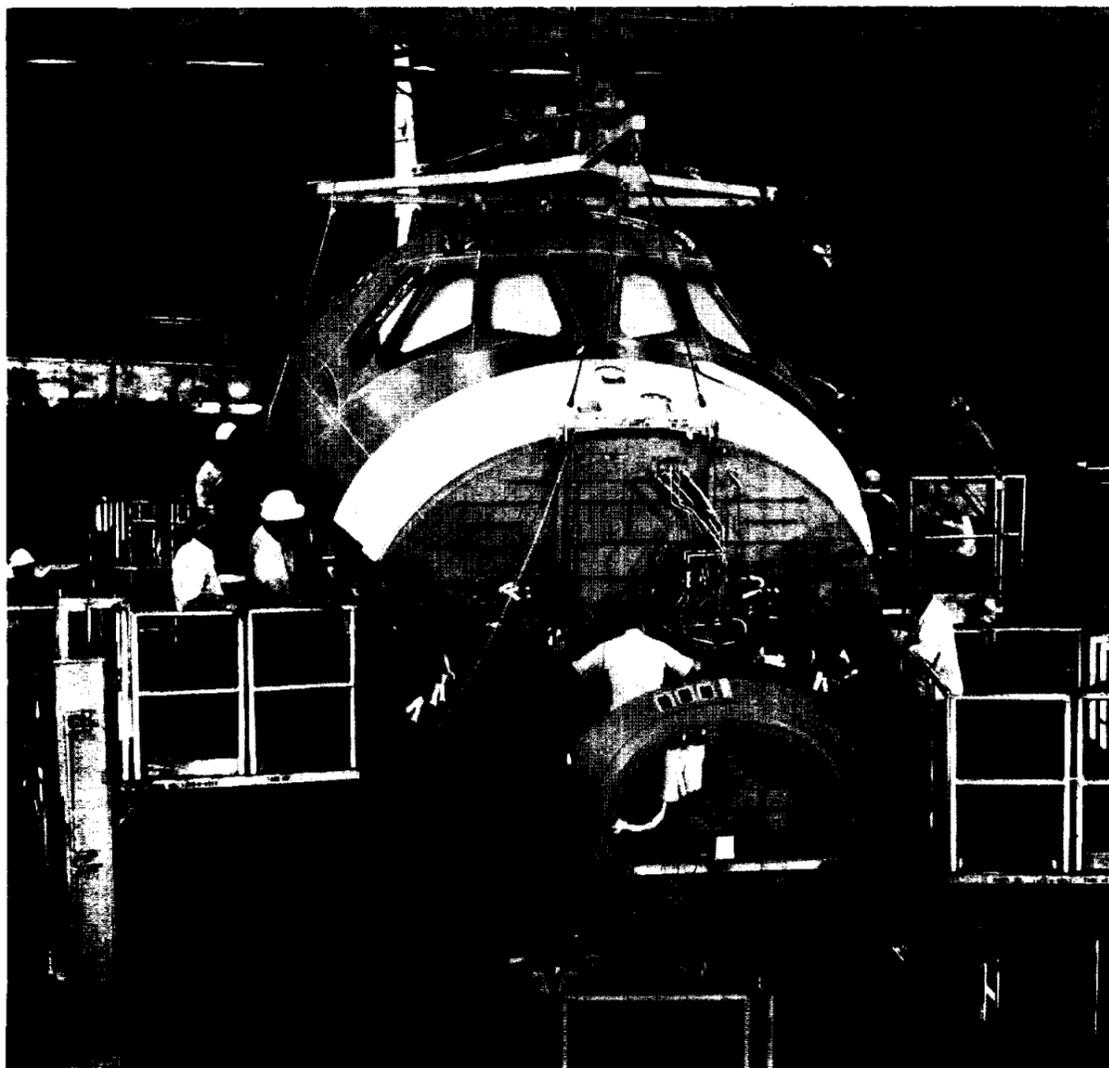
Working with Musgrave is Dr. Robert S. Clark, a nuclear-chemist of the Planetary and Earth Sciences Division and Dr. Charles S. Sawin, a cardio-pulmonary physiologist with the Biomedical Research Division. The test began at 7:00 am CST Monday and will end Sunday.

This is the second such test in which Musgrave has taken part. He was team leader for a similar life sciences simulation, along with Dr. Dennis R. Morrison, in October of 1974. The week-long simulation following a prescribed flight plan is designed to evaluate proposed Space Shuttle ground support and flight crew operational procedures, data handling techniques and integration concepts between man and machine, as well as demonstrate the feasibility of a group of 20 biomedical experiments and one space physics experiment. JSC Life Sciences Directorate planned and conducted "Sim II."

The Space Physics experiment is a cosmic ray laboratory experiment which has already been flight tested on two previous balloon flights from Palestine, Texas. This particular experiment which Clark is performing is behind the Spacelab and is representative of pallet mounted experiments planned for Spacelab. It is designed to measure high energy cosmic rays in the upper atmosphere.

Spacelab is a project of the European Space Agency, a consortium of 11 European countries which is funding and constructing the laboratory for use aboard the Space Shuttle in the early 1980s. The laboratory is designed to carry multi-discipline scientific payloads

(Continued on page 2)



ORBITER MILESTONE — The upper forward fuselage of Space Shuttle Orbiter 101 is lowered into position over the pressurized crew compartment (see photo, January 16 Roundup) at Rockwell International Space Division assembly plant at Palmdale, California. The last major components for Orbiter 101, the cargo bay doors, are scheduled to arrive at Palmdale in March. (RI photo)



NEW FEW CREW - Newly-elected officers and committee chairwomen of the JSC-Ellington AFB chapter of Federally Employed Women, Inc. (FEW) meet to plan activities for the Abigail Adams Chapter. Left to right are: public relations chairwoman Pamela Gladis, membership chairwoman Mary Shep Burton, regional coordinator Mary Y. Kerr, president Doris P. Folkes, treasurer Sharon Henderson, secretary Carolyn Welch, standing rules chairwoman Dorothy Phelan, and vice president-program chairwoman Renee Hall.

FEW Forms Chapter For JSC-Ellington

Federally Employed Women, Inc. (FEW) has formed a new chapter serving employees of NASA/JSC and Ellington AFB. The Abigail Adams Chapter will meet on Wednesday, February 18, 5:30 pm at the Gilruth Recreation Center.

FEW works as a private group in support of the Federal Women's Program goals of enhanced opportunities for the hiring, training, and promotion of women in all of the Federal service. On the national level, FEW works as a pressure group, lobbying at all levels to improve the status of women employed by the Federal government. Individual FEW chapters monitored the level and nature of support given the Federal Women's Program by local agencies.

FEW offers many services to all government employees who seek and support equal opportunity. One such service is an active effort to increase job opportunities for women through a nation-wide talent bank and the publication of available positions in a number of Federal agencies.

The Abigail Adams Chapter of FEW expects to cooperate with the Greater Houston and Galveston chapters in special events of significant interest to women, such as the seminar "Our Challenge: Equal Partners" presented as JSC in September 1975. For membership or other information, please call Doris Folkes (ext. 2569), Mary Shep Burton (ext. 4481) or any FEW officer.

Spacelab

(Continued from page 1)

inside the 60 foot long and 15 foot diameter payload bay of the Shuttle Orbiter.

The three scientists in the Spacelab mockup are in communication with flight operation engineers and scientists working at control stations outside the mockup. The mockup, constructed by the JSC Bioengineering Systems Division and Technical Services Division, is outfitted, instrument-wise and experiment-wise, just as the Spacelab of the 1980s will be outfitted.

In addition to the 14 prime and six alternate biomedical experiments, the three crew members will perform demonstrations in support of 14 operational test requirements, the results of which will be used by engineers, scientists and flight planners in preparing inflight crew activities, procedures and flight planning and scheduling for the Space Shuttle era. The latter includes such studies as personal hygiene aboard the Orbiter, general housekeeping and special purpose cleaning and maintenance concepts, and functional utility of the Orbiter aft deck from which many of the Spacelab experiments will be performed and monitored.

New Times Set For Film Series

Because of Auditorium scheduling conflicts, the recently-announced Management Development Film Series will start at noon on the scheduled dates - one half hour later than previously announced. The summations by University of Houston's Dr. Winford Holland and Dr. Walter Natelymeyer will conclude by 1 pm. Contractor employees may also attend the film series with supervisory permission.

The revised film series schedule is as follows: Motivation Through Job Enrichment, February 5; the Self-Motivated Achiever, February 18; Understanding Motivation, February 19; Theory X and Theory Y, Part 1, February 25; Theory X and Theory Y, Part 2, February 26; Human Nature and Organizational Realities, March 3; and the Management of Human Assets, March 4.

An announcement on the Life Cycle Theory of Leadership short course, scheduled for April 13, 14 and 15, will be issued later. The course will be held in either the main Auditorium or in the Bldg 30 auditorium.

National Black History Week
Building 2 Auditorium
Festival U.S.A.: Let Us Celebrate

Wednesday, February 11
11:30 a.m.

Cultural Expressions

Introduction	Baley Davis
Ball High School Variations	Ball High School Department Galveston, Texas Directed by: Richard Wallace
Gospel Solo	Lynette Randolph
Prose	Robbin Mathews LaMarque Jr. High School "Gavel Grease Paint" Club LaMarque, Texas Sponsor: Francis Ashby
Jazz Solo	Lynette Randolph
Forest Brook Stage Band	Forest Brook High School Houston, Texas Directed by: Ronald Thornton
Gospel Solo	Lynette Randolph
Prose	Robbin Mathews
Jazz Solo	Lynette Randolph
Forest Brook Stage Band	Forest Brook High School
Soul Searching Music of the Black Man - A History?	"Die Gruppe" M. C. Williams High School Drama Department Houston, Texas Director: Lee Turner

Thursday, February 12

Film - "Legacy of a Dream"	Introduction: Herman Hines
Times: 11:30 and 12:30	

Friday, February 13
 1:00 p.m.

Opening Remarks	Joseph D. Atkinson, Jr. Chief, Equal Opportunity Programs Office
Welcome	Christopher C. Kraft, Jr. Director, Johnson Space Center
Introduction of Platform Guests	Julius T. Mayhorn, Jr.
Introduction of Speaker	Howard L. Renfro
Speaker	Ruth Bates Harris Deputy Assistant Administrator for Community and Human Relations NASA Headquarters
Introduction of Speaker	Alotta M. Edison
Speaker	Judge Andrew Jefferson
Closing Remarks	Quarance J. Patin

Refreshments, Art Display.

Toastmasters Form Chapter

A new chapter of Toastmasters International next month will be formed at JSC. Meetings will be scheduled during extended lunch hours on the second and fourth Wednesdays of each month.

Toastmasters International is an educational organization which provides a professionally-designed program geared to improve the individual's ability to communicate and develop leadership and executive potential. Members progress through the program at their own speed, participating in scheduled activities centered around public speaking assignments and constructive criticism from their fellow toastmasters.

Sponsored by the Federal

Women's Program Committee as a valuable developmental experience, participation in Toastmasters will be considered official training. NASA can not reimburse employees for membership fees, but members will receive all other training benefits, including documentation of training in the official Personnel Folder and the extra one-half hour for lunch twice a month.

Membership is limited to forty, so applications will be accepted on a first-come, first-served basis. Supervisory approval is required as part of the application process. For information and applications, call Sharon Henderson at 4766.

ROUNDUP 

NASA LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS

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Editor: Terry White Photographer: A. "Pat" Patnesky

HANG a...

COST REDUCTION REPORT
(FORM 1105A) ON US...

NOW!!!



**'CAUSE WE DON'T GET CREDIT
 LESSEN IT HAS BEEN RECORDED!!!**

BH4-COST REDUCTION OFFICE

EAA ATTRACTIONS

TICKETS AVAILABLE

On sale in Bldg 11 Exchange Store 10 am to 2 pm, no refunds: Vera Miles in *Divorce Me, Darling* at Windmill Dinner Theater, \$14/couple. *Norman, Is that You?* at Dean Goss Dinner Theater, \$16/couple. Sea Arama adults \$3.25, children \$2.25. Houston Livestock Show and Rodeo: evening March 2 Charlie Pride, evening March 7 Mac Davis, \$5.50/person. Free Disney Magic Kingdom and Lion Country Safari cards. Ticket sales end February 13 for February 21 EAA Country-Western Dance, \$7.50/person.

4592

EAA now has its own telephone number — 4592 — which is connected to a recorder checked several times a day. Questions that cannot be answered by the *Roundup* EAA column, special flyer or bulletin boards should be put to the recorder; a human will call back shortly.

EMPLOYEE SURVEY

The EAA Executive Board is preparing an employee survey to determine current employee desires and to aid in activity planning to cover maximum employee interest and participation. The survey should be distributed within the next two weeks. Please take a few minutes to read and fill out the survey and return it to your EAA rep.

JSC DANCE CLUB

New classes in ballroom dancing — foxtrot, cha-cha, waltz, swing, rumba, whip, rock, samba, polka and tango — begin February 18 at 7 pm in room 204 of the Gilruth Recreation Center. Bob and Rae Calvert are really great teachers, and the cost for 10 lessons is

\$37/couple. Besides learning lots of fancy steps, we really have fun in class. Did you know that dancing is one of the best forms of exercise? Intermediate and advanced classes will be held Wednesdays from 8:30 to 10, plus one intermediate class at 7. For additional information or matching with a partner, call Edi Quinn at 3431 or Charles Krpec at 5551.

EAA LEAGUE REGISTRATION

League play for competitive mixed volleyball and open basketball will begin March 1. Two nights will be open for each activity, with a limit of 16 teams in first-come registration starting February 2. The unsubsidized activities have entry fees of \$45 for volleyball and \$75 for basketball. League registration must be made in person with Jack Boykin room 1035 Bldg 16, ext 4476.

CALCULATORS

Hewlett Packard has announced a new applications book for the HP-21 which normally retails for



\$10, but which will be given free to purchasers of HP-21s between January 12 and March 15. Buyers of HP-65s between February 1 and April 30 will have their choice of any four software pacs free (\$180

retail) and any five of the 15 most popular user's library programs (\$15 retail). For the Exchange Store HP-65 price of \$686, one receives \$195 worth of free software.

EAA CARDS

New EAA cards have not been issued because of potential changes in membership requirements. Present cards are valid until these changes are resolved.

SAFETY DEVICES

A new pricelist/order blank for safety device direct order is being prepared for distribution. In addition to the items offered before Christmas, the list includes safety ladders, safety cans and add-on sensors. The items are all first quality with no EAA markup.

Technicolor Gets Photo Contract

Technicolor Graphic Services, Inc., of Hollywood, California has been awarded a contract for JSC Photographic Support Services.

Technicolor will be responsible for management and operation of the motion-picture, precision, metric and still laboratories, laboratory analysis and support, and audio-visual support at JSC.

The contract will be a cost-plus-award-fee type contract and is awarded for a one-year period beginning January 1, 1976, and ending December 31, 1976. The contractor will employ approximately 112 persons and the estimated amount of the contract is \$2,242,000.

Roundup Swap-Shop

Swap Shop advertising is available to JSC and on-site contractor personnel. Articles or services must be offered as advertised, without regard to race, religion, sex or national origin. Ads should be 20 words or less, including home telephone number. Name and office code must accompany, but need not be included in ad copy. Typed or printed copy must be received (AP3 Attn: Roundup) by Thursday of the week before publication.

BOATS

8-ft sailing dinghy w/sail, daggerboard, oars, oarlocks, \$130. Klotz, 488-1514.

VEHICLES

71 Honda CL70 street bike, \$175. White, 554-2916.

75 2-dr Granada, red w/tan vinyl roof, 200 CID six, 3-sp, air, AM/FM, low miles, must sell, \$3850. Pool, 333-2805.

71 Chevy Malibu, R&H, air, auto-trans, wife's car, good cond, \$1695. Matthews, 495-5575.

69 Toyota Corona Standard, air, stereo cassette plyr/rcdr. Riojas, Texas City 945-3094.

74 Pinto wagon w/Squire options, auto, air, AM/FM, 8-trk stereo, xInt cond, \$2800 firm. Gibson, 487-3238.

74 Triumph Spitfire, 9,000 miles, AM/FM/stereo, air, mags, radials, foglites, lugrack. 944-3342.

73 Chevelle Malibu, copper w/saddle-brwn landau top/int, pwrsteer, auto, 350 eng, AM, air, htr, good tires, \$2600. 631-1344.

67 Barracuda, perf int, air, radio, good tires, new batt, 1st owner, needs brake repair, \$475. Baker, 483-5273.

75 Honda CB750 w/Windjammer III, cush bckrst, eng guards, 4,000 miles, xInt cond. Clowdis, 471-2447.

3-whl Harley-Davidson elec golfcart, good cond, 18 mos old, \$895. Thayer, 337-3335 after 5.

70 Malibu, auto, air, pwr steer, xInt cond, \$1295. 482-7546.

Man's 10-sp, bike, like new, cost \$125, sell \$65. 482-7546.

26-in 3-sp, bike in good cond, \$25. Brenton, 483-2021.

72 VW van custom camper conversion, air, new tires, many xtras, low miles. Clisco, 488-5185.

68 Buick 6-pass sport sta wgn, all pwr, good cond, \$750 firm. 334-1619.

75 Camaro, red/white vinyl, AM/FM stereo tape, auto, pwr, tilt wheel, sport mirrors, 12,000 miles, \$4400. Cornett, 482-3603.

72 Chevy 10-30-series truck service manual, \$5. Behrend, 483-2961.

70 Opel GT, xInt rubber, good cond. 333-2974.

PETS

AKC-reg Cocker Spaniel puppies, buff, champ bloodlines, incl pedigree, \$125. 482-7858.

Brittany Spaniel pups, champ and gundog breeding, great dispositions, \$100. 482-2880.

WANTED

69 to 71 Dodge pickup or van w/o engine. Kennedy, 488-5691.

Boat cover for 18-ft outboard. 738-1151.

24x30-in portable drafting table w/T-square and triangles. Bland, 333-4580.

Auto ramps. Watkins, 534-2437.

PROPERTY & RENTALS

Galveston condominium apartment, fully equip, 2-bdr, sleeps 7, weekly rental, attractive rates for considerate tenants. Clements, 474-2622.

75x137-ft wooded waterview lot at Point Lookout, Lake Livingston, utilities, restrictions, private campground, \$3295. 946-7587.

2-acre lot in El Dorado subdiv Friendswood, \$7500. Zupp, 482-7156.

Brick colonial in Fairmont Park from owner, 2343 sq ft, 4 bdr, 2-1/2 baths, 1-1/2 kitch, dbl gar, builtins, low 40s — far below current build price, 9.5% loan avail at rate comp to or below FHA, call for appt, no realtors, 471-3762.

Communications Satellite Launched for INTELSAT

The second INTELSAT IV-A commercial communications satellite at Roundup presstime was to have been launched by NASA aboard an Atlas/Centaur rocket from Kennedy Space Center, Fla., yesterday.

The satellite, which weighs 1,500 kilograms (3,330 pounds) at launch, is intended for service in the Atlantic Ocean region.

This second INTELSAT IV-A supplements the first INTELSAT IV-A satellite launched Sept. 25, 1975 and the INTELSAT IV worldwide network of seven operating satellites. Presently there are three INTELSAT IV satellites over the Atlantic Ocean, two over the Pacific and two over the Indian Ocean.

The INTELSAT satellites are owned by the International Telecommunications Satellite Organization (INTELSAT). The Communications Satellite Corporation (COMSAT), the United States member, is also the management services contractor for the satellite system. NASA is reimbursed for all costs of the Atlas/Centaur and launch services by COMSAT on behalf of INTELSAT, under provisions of a launch services agreement.

An INTELSAT IV-A satellite is able to carry approximately 6,250 two-way telephone conversations and television.

The Atlas/Centaur-37 launch vehicle was expected to place the INTELSAT IV-A in a highly elliptical orbit ranging from approximately 459 to 35,880 kilometers (341 to 22,300 miles). After re-

orientation of the satellite, a solid propellant rocket motor aboard the spacecraft was to be fired to circularize the orbit at synchronous altitude 35,880 km (22,300 mi.) over the equator. At that altitude, because the speed of the spacecraft in orbit matches the rotational speed of the Earth, the satellite remains in position over one spot.

The launch of INTELSAT spacecraft aboard Atlas/Centaur rockets requires the coordinated efforts of a large government and industry team. NASA's Lewis Research Center, Cleveland, has management responsibility for the Atlas/Centaur development and operation. NASA's John F. Kennedy Space Center, Fla., is assigned vehicle checkout and launch responsibility once the vehicle reaches Cape Canaveral.

Singer to Build Orbiter Simulator

JSC has awarded a letter contract to the Singer Company, Simulation Products Division, Binghamton, New York, for development of a Shuttle Mission Simulator (SMS) for use as a trainer for the Space Shuttle Orbiter Vehicle crew and flight controllers.

The SMS, to be used for training for Shuttle Orbital Flight Tests one and two, will be delivered by March 31, 1978. The modifications to the SMS required to train crews for Orbital Flight Tests three and subsequent will be delivered and installed by March 31 1979.

Singer will design, develop, fabricate, install, and test a simulator consisting principally of a Motion Base Crew Station and a Fixed Base Crew Station, with integration of associated visual systems and computer systems.

The SMS will be used to train crews and flight controllers in all Orbiter mission phases (launch, orbital insertion, orbital operations, re-entry, and landing).

SMS work will be performed primarily in Binghamton, New York; Sunnyvale, California; and Houston, Texas. Estimated value of the program is \$28,600,900.

The work will be managed by JSC.

Cultural Club 1976 Dues Due

Mexico in the fall, a week in the Caribbean, Christmas in the Rockies, Lost Wages (er...Las Vegas), New Orleans' French Quarter... perhaps springtime in Paris.

Trips to these places and more are planned for 1976 by the Aerospace Employees Cultural Club and 1976 dues are due before February 14 for old members wishing to avoid another initiation fee.

Other persons who wish to join the club and take part in some of the trips are asked to send \$4 for a single membership or \$7 for a family membership to the Aerospace Employees Cultural Club, P.O. Box 57324, Webster, TX 77598, or call membership chairperson Lois Miller.

JSC Extends Ford Contract

JSC has signed a supplemental agreement with Aeronutronic Ford Corporation, Space Information Systems Operation of Houston for an extension of six months to the current contract.

Direct labor hours and materials for performance of ground data hardware and software systems engineering, implementation, maintenance and operations will be performed under the contract.

Work to be performed consists of system engineering and integration, maintenance, operations, and other support functions, such as logistics, reliability and quality assurance for the Mission Control Center (MCC) and various other ground based data systems managed by JSC.

The contract is a cost-plus-award-fee contract. The additional effort valued at about \$10,690,633, brings the estimated value of the contract to approximately \$278,400,000.

Aeronutronic Ford will perform the majority of the work at their Houston location with support from their facilities at Willow Grove, Pennsylvania.

MISCELLANEOUS

Caravelle student trombone w/Bach mthpc, case, \$100. Arnim, 333-4362.

Fiberglass surfboard, cost \$165; must sell, take any rsnl offer. 482-7546.

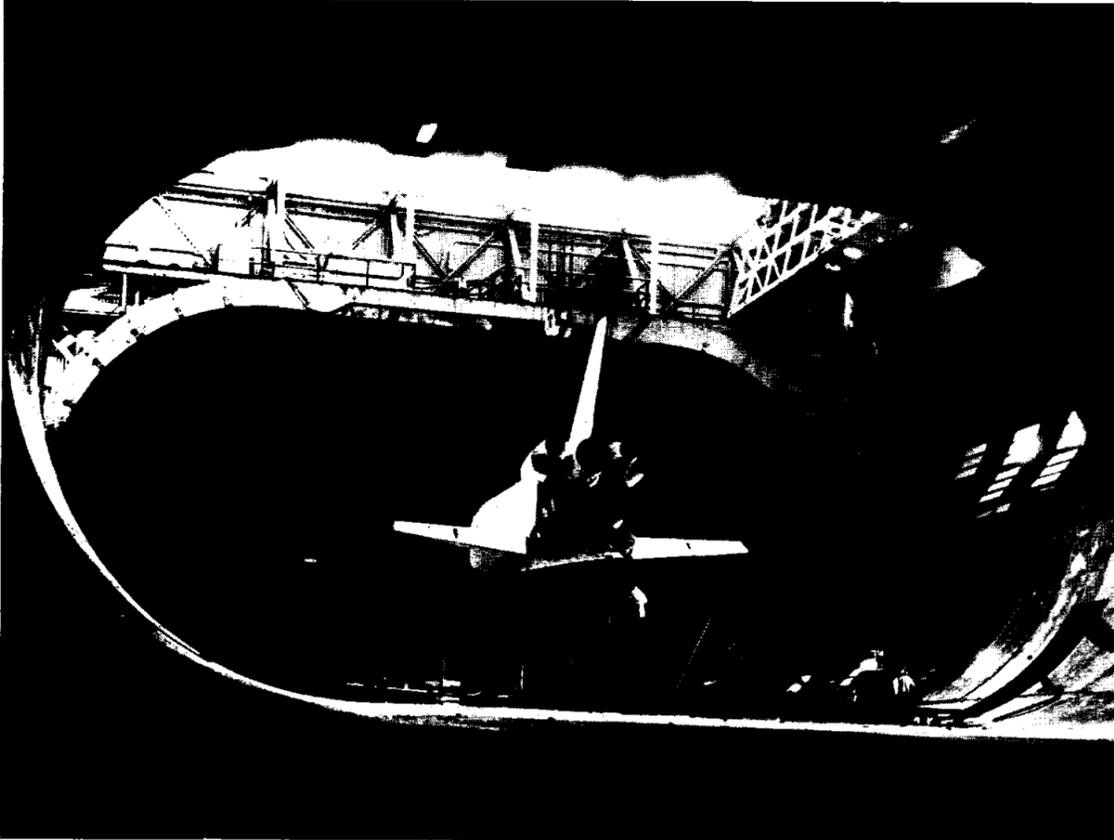
King B w/F attachmnt trombone, xInt cond, \$450. 482-7546.

Fiberglass fishing buoy floating seat, \$25. Klotz, 488-1514.

Mercury Mark 25 OB motor w/6-gal tank, \$55; 10-gal aquarium, \$5; stand, \$5. Casserly, 489-6433.

New matched set left-hand golfclubs, 1-3-4 woods, 3-5-7-9 irons, \$25. 471-0089.

Black & Decker 7761 universal spray/inflator kit, new — never used, cost \$50, sell \$35. Lindsey, 488-0517.



CAPTIVE WINDSTORM — A one-third-scale Space Shuttle Orbiter is readied for tests in NASA Ames Research Center's 40x80-foot windtunnel at Mountain View, California. The 13-meter-long (43.9 feet) Orbiter model is being tested in low-speed atmospheric flight regimes in support of the 1977 Orbiter approach and landing tests at NASA Dryden Flight Research Center, Edwards, California.

New Credit Union Voting Broadens Participation

The new nomination and voting procedures adopted by the JSC Federal Credit Union for the 1976 election of the Board of Directors and Credit Committee Members are designed to increase the participation of members in the election process. This procedure allows for voting to take place prior to the annual meeting, giving those members who cannot attend the annual meeting a chance to cast their votes. Voting will also take place at the annual meeting prior to the meeting being called to order. The use of voting machines is planned to facilitate voting and to allow the results to be announced at the annual meeting.

The nominating procedures direct that the Nominating Committee select at least one candidate for each position; however, nominations for vacancies may also be made by petition signed by at least one percent of the voting membership (100 members). Such nomination must be accompanied by a certificate from the nominees stating that they are agreeable to the nomination and will serve if elected to the office. The nominations must be filed with Tom Krenek, Secretary of the Board, by February 18, 1976. The new procedure does not allow nominations to be accepted from the floor at the annual meeting.

Erratum...

Sorry 'bout that!

Gremlins and type-lice invaded the January 16 *Roundup* page 1 story about renaming FRC. The correct new name for the Center is the Hugh L. Dryden Flight Research Center. Omission of the word "Flight" was overlooked in galley proofs and in the final camera-ready paste-up. One has to admit *Roundup* seldom makes mistakes.

Roosa Retires

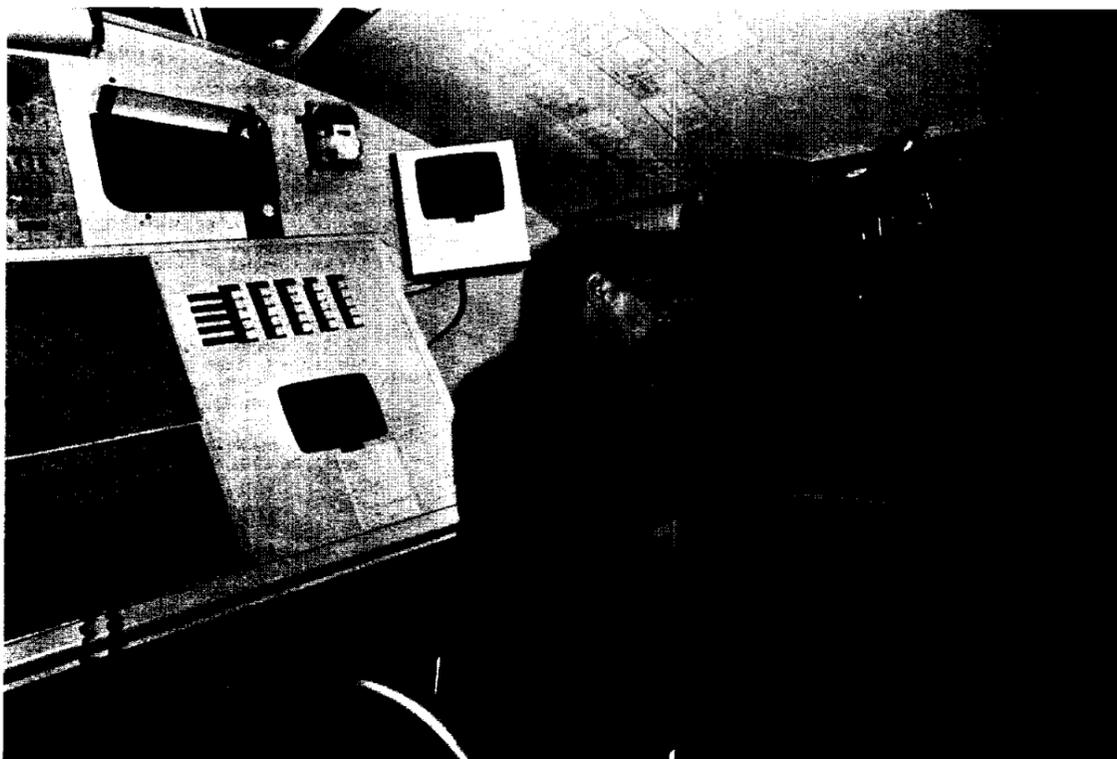
Astronaut Stuart A. Roosa will retire from the Air Force and leave NASA effective Sunday.

Roosa, 42, is a colonel with 22 years service. He has not yet announced his plans for the future.

As command module pilot on Apollo 14 in 1971, Roosa conducted the first extensive lunar orbital science activities during the 33 hours his fellow crewmen, Alan B. Shepard, Jr., and Edgar D. Mitchell, were on the moon's surface. He logged 216 hours and 32 minutes of space flight.

Roosa served as backup command module pilot for the Apollo 16 and 17 missions and is now assigned to the Space Shuttle Program. He was selected as a NASA astronaut in 1966, and his retirement reduces the number of astronauts assigned to JSC to 28:

Roosa and his wife Joan, have four children.



THE NIGHT SHIFT — Dr. Robert S. Clark, nuclear chemist with the JSC Planetary and Earth Sciences Division, operates the Cosmic Ray Magnetic Spectrometer from the mockup Orbiter aft flight deck payloads specialist station in the Spacelab Life Sciences Mission Simulation which ends Sunday in Bldg 36. Clark conducts his experiment simulation chores at night while Sim II crewmates Dr. Story Musgrave and Dr. Charles S. Sawin are in the sack. (See story, additional photo on page 1.)

Pioneer 11 Tweaked For Saturn Fly-By

NASA's Pioneer 11, headed for the ringed planet Saturn, has successfully completed what officials consider its riskiest course-change maneuver.

Controllers increased spacecraft velocity 108 km/hr (67 mph) on December 18 to assure that Pioneer has two options at Saturn. The most interesting possibilities are one in which Pioneer would fly between Saturn's rings and the planet, and one in which the spacecraft would come in under the rings and then pass upward outside of them.

To do this, controllers at Ames Research Center, Mountain View, Calif., had to lose communications with Pioneer, 458 million kilometers (287 million miles) from Earth, for several hours, and allow the spacecraft to command itself to change position, fire its thrusters and then reposition itself to point its antenna back toward Earth in order to resume communications.

Had a problem developed while the spacecraft were turned away from Earth, controllers would have had no radioed information on the conduct of Pioneer 11.

"We are highly pleased with the operation," commented Project Manager Charles F. Hall of Ames, which manages the Pioneers.

Pioneer 11 will take the first close up pictures of Saturn and its brightly-lit rings when it reaches the planet in 1979. It flew past Jupiter last December, taking the first pictures of that planet's polar regions. Recent picture-taking has shown that its electronic camera is still working well. Pioneer 11's trip from Jupiter to Saturn spans one and a quarter billion miles across the solar system.

During the Jupiter fly by, Pioneer traveled faster than any previous man-made object, 171,000 km per hour (107,000 mph), and it is still traveling about 64,000 km per hour (40,000 mph) due to the

boost in velocity from giant Jupiter's gravity and orbital motion. Because of this high speed, Pioneer already has covered a third of the distance between Jupiter and Saturn — about 640 million km (400 million mi.).

If officials and scientists decide to fly the spacecraft inside Saturn's rings, Pioneer should also get a close look at Titan, Saturn's sixth moon. Titan is larger than the planet Mercury.

Bioprocessing

(Continued from page 1)

following topics: Space Shuttle and Life Sciences; Spacelab; NASA's Space Processing Program; Working in Space; Materials Behavior in Space; and Space Processing on Skylab and Apollo-Soyuz.

On the March 11 agenda are: Cell Experiments in Zero-g; Gravity Sensors in Cells; Bioprocessing/Biological Separations; and Biosynthesis Using Tissue Culture and Fermentation Techniques; followed by workshop meetings on Biotechnology, Cell Biology, Biosynthesis, and Pharmaceuticals.

Researchers wishing to register for the Colloquium or to receive the published proceedings should contact Dr. Dennis R. Morrison/DF2, NASA Johnson Space Center, Houston, TX 77058, telephone 713/483-2031.



Art Exhibit 'Cyberonaut' Opens Feb. 8

"Cyberonaut," a three-part exhibition by five Houston artists, will be in the JSC Auditorium for one month starting February 8.

Ron Hargrove, Bob Kirkwood, Lee Stricklin and Doug and Vicki Reneau work in the Mandala form which allows them "to exchange and translate all kinds of information in an interacting field or inclusive format which facilitates pattern recognition." The group says JSC was chosen as a show site because the Center is "an interesting place where all types of information and experience is exchanged and translated into a common effort."

In a less cerebral vein, two walls of the Auditorium's Gilruth/astronaut memorabilia room have been redecorated with plaques, paintings and Russian tapestry, and the flag case formerly located near the Apollo 17 command module has been moved to a location just outside the memorabilia room.